

MULTIMEDIA



UNIVERSITY

STUDENT IDENTIFICATION NO

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# MULTIMEDIA UNIVERSITY

## FINAL EXAMINATION

TRIMESTER 2, 2018/2019

BMR 3174 SUPPLY CHAIN MANAGEMENT  
(All sections / Groups)

5 MARCH 2019  
2.30 p.m. – 4.30 p.m.  
(2 Hours)

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### INSTRUCTIONS TO STUDENTS:

1. This Question paper consists of 8 pages with 2 Sections only.
2. **Section A:** Answer all **TWO (2)** questions.

**Section B:** Answer any **TWO (2)** of the **THREE (3)** questions.

3. The distribution of the marks for each question is given at the end of each question.
4. Please write all your answers in the Answer Booklet provided.

**SECTION A:****INSTRUCTION: ANSWER ALL TWO (2) QUESTIONS (50 MARKS)****QUESTION 1**

MMU imports books from all over the world and delivers them to major bookstores in Malaysia. MMU currently has three warehouses in the cities of Pulau Pinang, Sarawak and Johor. On the demand side, MMU has three major bookstores: BPH, Copular and DingDo. The monthly capacities for the warehouses and monthly demands for the bookstores are as follow

Warehouse	Monthly Capacity
Pulau Pinang	20,000
Sarawak	40,000
Johor	30,000

Bookstore	Monthly Demand
BPH	27,800
Copular	8,000
DingDo	33,000

Cost (RM) to deliver a book from Warehouse to Bookstores

	BPH (RM)	Copular (RM)	DingDo (RM)
Pulau Pinang	2.00	3.00	3.50
Sarawak	5.00	1.75	2.25
Johor	1.00	2.50	1.00

- a) Identify the shipping cost for MMU using the Initial Solution Method. (5 marks)
- b) Use Northwest Method to identify the transportation cost. Which method is better, Northwest Method or Initial Solution Method? Justify (5 marks)
- c) Based on the output from b) Northwest Method, identify any possible improvement via Stepping-stone method and find the lowest delivery cost. Students are required to show all the improvement steps leading to optimization. (15 marks)  
[Total: 25 marks]

**Continued...**

## QUESTION 2

De-Safi is opening a new massage centre and is considering how to arrange the six different department of the centre i.e. 1) Waiting, 2) Reception, 3) Record and Storage, 4) Massage Therapy, 5) Patient Examination, 6) Advanced Therapy. A map of the centre as follows. The six marked areas are big enough to handle any of the departments. **However, area A has been reserved for Reception Department (RE).**

Layout of the massage centre

A	C	E
B	D	F

Distance between areas

	A	B	C	D	E
A	0				
B	15	0			
C	15	25	0		
D	25	15	15	0	
E	30	40	15	25	0
F	40	30	25	15	15

Number of trips between departments

To	Waiting (WA)	Reception (RE)	Records and Storage (RS)	Massage Therapy (MT)	Patient Examination (PE)	Advanced Therapy (AT)
From						
WA	-					
RE	100	-				
RS	0	150	-			
MT	35	5	10	-		
PE	15	5	10	5	-	
AT	50	10	15	40	0	-

Given that De-Safi has committed to maintain Location A for Reception Department (RE),

- a) Generate the best weighted-distance score for this layout.

(10 marks)

- a) Built upon the solution of a), now select two departments to switch (except Reception). What is the best weighted-distance score for your solution?

(15 marks)

[Total: 25 marks]

Continued...

**SECTION B:****INSTRUCTION: ANSWER ANY TWO (2) QUESTIONS (50 MARKS)****QUESTION 3**

Melaka-One Sdn Bhd is a manufacturer of office chairs that are sold through major retailers in Malaysia. The following combined sale forecast for the next 6 months as below:

Month	Sales Forecast
Jan	750
Feb	800
Mar	860
Apr	980
May	1080
Jun	820

**Operating Costs**

1) Regular production cost (inclusive of worker's salary and material cost):	: RM 200 per chair
2) Overtime production cost (inclusive of salary, material and overtime cost):	: RM 250 per chair
3) Inventory Holding Cost:	: RM 10 per chair
4) Average labour hour per chair:	: 20 hours
5) Regular production units per month:	: Maximum production units using regular hours - 850 chairs per month
6) Allowable Overtime:	: Overtime is limited to the maximum 10% of regular production units
7) Regular hours per month per worker:	: 160 hours
8) Hiring Cost:	: RM 1750 per worker
9) Firing Cost:	: RM 1500 per worker
10) Previous month outputs	: 800 chairs
11) Beginning inventory	: 40 chairs
12) Stockout	: RM 300 per chair. Stockout is limited to the maximum of 10 units for the entire 6 months

Which of the following production plan is lower

- a) Plan A—Level strategy, calling for a one-time adjustment of the workforce before month Jan begins.

(12 marks)

- b) Plan B—Mixed strategy. The company has to use Level Strategy for the first three months and follow with Chase Strategy for another three months.

(13 marks)

[Total: 25 marks]

**Continued...**

**QUESTION 4**

MMU is offering a new line of services. The service activities are as follow:

Activity	Description	Duration (Days)	Immediate Predecessor	Normal Cost (RM)
A	Consult with customers	3.5	None	100
B	Determine service hours	2	None	50
C	Determine the office layout	4.5	A,B	40
D	Hire workers	2	A	70
E	Train workers	2	C	20
F	Test workers	3	D,E	30
G	Pilot test new service	2	F	80
H	Apply for approval	4	E	50

Solve the following

- a) Draw a precedence diagram for the new service. How many days are required to complete the service? (5 marks)
- b) Compute the earliest start times, earliest finish times, latest start times, latest finish times and slack times. Write these values in the precedence diagram. (10 Marks)
- c) Every day of delay in the service costs MMU RM 500. Suppose we know the following:

Activity	Crash Cost (RM)	Maximum Crash Time (day)
B	50 per day	2
D	100 per day	1
F	150 per day	1
G	200 per day	1
H	100 per day	2

Should MMU try to crash the service? If so, which activity and how much will the company save?

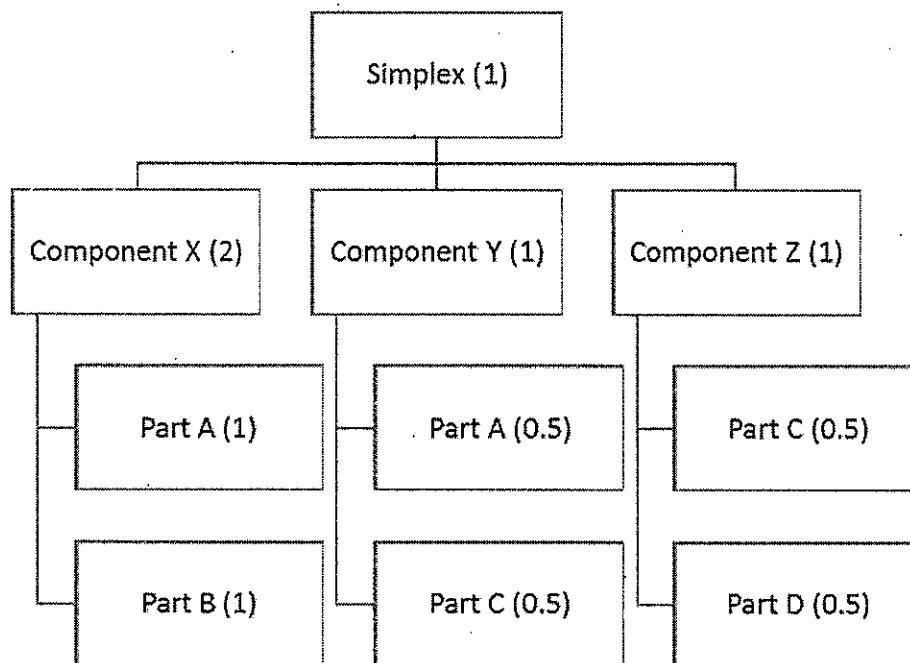
(10 marks)

[Total: 25 marks]

**Continued...**

## QUESTION 5

After graduating from university, you take a job with Multi-Manufacturer Utama. You have been assigned as the production planner for Simplex, a multi-purpose scanner. The bill of material (BOM) for the product follows:



BOM for Simplex

MPS Schedule for Simplex

Week	1	2	3	4	5	6	7	8
Forecasted demand (unit)	100	100	125	125	150	150	175	175
Booked orders (unit)	105	95	110	96	112	109	124	120

Inventory Record Data

Description	Product	Component			Part			
		X	Y	Z	A	B	C	D
Data Category	Simplex							
Lot Sizing Rule	FOQ = 350	FOQ = 1000	POQ = 6	L4L	FOQ = 950	L4L	POQ = 3	FOQ = 100
Lead Time (wk)	1	1	1	2	2	2	1	1
Scheduled Receipts				Wk 2 = 200		Wk 2 = 500 Wk 3 = 300	Wk 5 = 200	
Beginning Inventory	86	150	100	0	500	300	0	0

Continued...

Plan the following

- a) Complete the Master Production Schedule (MPS) (5 marks)
- b) Suppose a customer in Kuala Lumpur calls and says he is facing a shortage of Simplex. It needs 200 units as soon as possible. Assuming you can make no changes to the MPS quantities or order booked, how quickly can it get the customer 200 units? Specify the quantities you can deliver and when. (5 marks)
- c) Suppose the customer says it needs the units now, not in three weeks. What could you do to deal with this request? Show the workings in the Master Production Schedule. (5 marks)
- d) Complete the Material Requirement Planning for Component X. (5 marks)
- e) Complete the Material Requirement Planning for Part B. (5 marks)

[Total: 25 marks]

**Continued...**

**TABLE A & B****Table A: Master Production Schedule for**

Lot size:	Month							
Lead Time:								
Forecast								
Customer Orders								
On hand								
MPS quantity								
MPS start								
Available to promise (ATP)								

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Lot size:	Month							
Lead Time:								
Forecast								
Customer Orders								
On hand								
MPS quantity								
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**Table B: Material Requirement Planning for**

Lot Size:	Month							
Lead Time:								
Gross requirements								
Scheduled receipts								
On hand								
Planned order receipts								
Planned order releases								

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Lot Size:	Month							
Lead Time:								
Gross requirements								
Scheduled receipts								
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**Continued...**

**Table B: Material Requirement Planning for**

Lot Size:	Month							
Lead Time:								
Gross requirements								
Scheduled receipts								
On hand								
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